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EXAMINER	
GRAHAM, ANDREW R	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/453,525	Applicant(s) HASEGAWA ET AL.	
	Examiner Andrew Graham	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 14 January 2005.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-5,7-9,11,13 and 15-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-5,7-9,11,13 and 15-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The applicant's amendments made to Claims 2, 5, and 21 in view of the previous rejections under 35 U.S.C. 112 of said claims suffice to overcome the basis of said rejections. Accordingly, said rejections are hereby withdrawn.

Response to Arguments

2. Applicant's arguments filed 1/14/2005 have been fully considered but they are not persuasive.

On page 12, lines 3-6, the applicant has stated, "GrosJean only discloses that the source 5 is cut off or muted when the DC offset is detected, and does not disclose that when the source 5 is already muted, a DC offset is then detected (i.e., when the input signal is muted) as recited in claim 10". The examiner respectfully disagrees. The DC offset detection of GrosJean, when considered in view of the relative detection circuitry 14 of Aoki, is the connection shown in Figure 2 near the arrow 29, wherein the voltages from the amplifiers (9,11) are combined and applied to second and third diodes (27,35). Based on the voltage that appears at this connection, the relay coil 21 is energized to disconnect the source 5 from the amplifiers (9,11) (col. 3, lines 6-22). The operation of this relay coil (21) does not prevent a signal from being applied via the interconnection at (29) to the diodes (27,35), and thus the relative detection of a DC offset at this interconnection in section 29 still would occur. Similarly, in

the system of Aoki, the system's response to the nonstandard DC offset does not interfere with the connections between the output terminals (28,29) and the detecting circuit (14), as detailed for example in col. 7, lines 49-68; col. 8, lines 1-17. The detection performed by circuit 14 in Aoki inferentially occurs continuously over time, by virtue of an audio signal applied at terminals 28 and 29, which is well known in the art to be a substantially time continuous signal in devices, such as the denoted radios or tape players (col. 1, lines 14-17; col. 3, lines 48-53). Accordingly, both systems of Aoki and GrosJean enable the detection of an nonstandard voltage during a period when a signal indicating a non-standard DC voltage has been detected. This response also applies to the applicant's arguments presented on page 14, lines 8-11.

On page 12, lines 13-16, the applicant has stated, "there is no motivation or need to provide the circuit of Aoki with the contact arms 19 of GrosJean (i.e., since the purpose of the contact arms 19 of GrosJean are to avoid supplying a signal to the power amps when a positive polarity DC potential is detected, which already is eliminated in Aoki)". The examiner respectfully disagrees. As noted by the applicant, both systems of Aoki and GrosJean are responsive to a non-standard level of DC offset. The system of GrosJean, however, is able to handle situations in which a transistor in a power amplifier fails, wherein the failure causes DC current to appear at the loudspeaker (col. 1, lines 10-18 and 60-68). In contrast, the system of Aoki relies upon the proper operation of amplifiers, such as

in 11, 12, or 13, to compensate for the DC offset (see, for example, col. 7, lines 59-68 and col. 8, lines 1-6, wherein 16 of amplifier 11 and amplifier 13 by virtue of V29 are involved). Accordingly, the DC-responsive circuitry would have provided loudspeaker protection in conditions of amplifier failure. This response also applies to the applicant's arguments presented on page 14, lines 17-21 and page 16, lines 14-18.

On page 13, lines 17-18, the applicant has stated, "although the reference discloses that the input signal 111 is not supplied to amp 102 when the bypass switch is closed, the reference fails to disclose that the input signal 111 is also prevented from being supplied to the amp 104". The examiner respectfully disagrees. Please refer to column 5, lines 19-33, wherein Kalb teaches that the output of both amplifiers (117,125) are equal to a primary voltage 141 when the bypass switch 122 is closed. This voltage 141 is not the input voltage 111 and thus the input voltage is also prevented from being supplied to the amp 104.

On page 15, lines 5-8, the applicant has stated, "since Aoki already discloses than any negative or positive offset voltages are eliminated, as set forth above, Applicant submits that one skilled in the art would not be motivated to further modify the circuit of Aoki to contain the switch 250 of Trump". The examiner respectfully disagrees. As discussed above, the system of Aoki relies on the proper operation of amplifiers in response to a detected undesired DC value. The system of Trump responds to an improper input signal or a

fault within the amplifier (col. 1, lines 5-10). The switch (250) provides direct protection to the loudspeaker, thus interrupting the amplifier output signal otherwise supplied to the loudspeaker. Accordingly, the response of Trump provides advantages over the response of Aoki, thus providing support for the combination of the teachings thereof. This response also applies to the applicant's remarks presented on page 18, lines 13-16.

On page 17, lines 3-4, the applicant has stated, "Also, GrosJean fails to teach or suggest how long the contact arms 19 remain open, such that the reference also fails to teach or suggest the claimed predetermined length of time". The examiner respectfully disagrees. As acknowledged by the applicant, the contact arms 19 in the system of GrosJean are opened. This open or disconnected state of the switches (19) is maintained by a latch means for at least a period of time. This period is determined by the properties of the involved resistances and capacitances (col. 3, lines 23-35). Thus, by virtue of construction of the latch with particular component values, such as the resistances or capacitances, this period of at least any length is necessarily predetermined.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. **Claims 9, 11-13, 15-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (USPN 4752744) in view of GrosJean (USPN 3959735).

Regarding **Claim 9,** Aoki discloses balanced transformerless (BTL) circuit that maintains the DC offset voltage at an acceptable, predetermined value. The structure of one embodiment of the system is shown in Figure 2. As can be seen, the embodiment comprises the components of a signal input (23), a preamplifier (11), a set of balanced amplifiers (12,13), a load or loudspeaker (30), and a difference amplifier (14) (col. 4, lines 30-38 col. 5, lines 1-14). The two amplifiers (12,13) are non-inverting are a part of a balanced transformerless circuit (10) that outputs a differential signal to the load (30) (col. 5, lines 1-34). These amplifiers (12,13) read on "a first amplifier which at least indirectly receives an input signal" and "a second amplifier which at least indirectly receives the input signal". The signals that are applied to the load (30) over the pair of output terminals (28,29) are also applied to the inverting and non-inverting terminals of a difference amplifier (14) (col. 5, lines 35-41). The output of the difference amplifier (14) is a signal that represents the DC offset present in the output signal that is applied across the load (30) (col. 5, lines 45-47). The output of the

amplifier (14) is connected to a transistor (16), which is part of the preamplifier (11)(col. 5, lines 47-51). In operation, the two potentials of the emitter terminals (15e,16e) have a specific voltage that defines a center, acceptable value of DC offset (col. 7, lines 37-68; col. 8, lines 1-66). The set of terminals detect and compensate for both positive and negative voltage offsets in order to maintain this standard potential (col. 8, lines 56-66). The combination of the difference amplifier (14) and the transistors (15,16) of the preamplifier (11) reads on "a control circuit". The amplifier (14) and its output read on "the control circuit detects the differential voltage between a first output signal output from the first amplifier and the second output signal output from the second amplifier to provide a DC offset". The concept of a center, standard voltage and the response to a detected offset voltage that is above or below this standard voltage reads on "wherein the control circuit determines whether or not the DC offset is larger than a prescribed voltage".

The system of Aoki does not specify:

- that the control circuit detects the DC offset when the input signal is muted and no input signal is supplied to the amplifiers

GrosJean discloses a system for detecting and protecting a loudspeaker output from receiving an undesirable positive or negative DC potential. Figure 2 illustrates one embodiment of the system wherein positive or negative DC potentials are applied through either

of a pair of diodes (35,27) to bias a transistor (23) (col. 3, lines 9-22). A switching means (7) comprises a movable contact arm (19) and is used in the presence of a positive or negative potential to disconnect the power source from the power amplifiers (9,11) (col. 3, lines 13-16). The disconnected state of the switches (19) is maintained by a latch means, the duration of which is determined by the properties of the involved resistances and capacitances (col. 3, lines 23-35). The operation of the switches (19) does not prevent a DC offset voltage from appearing at the interconnection junction in 29, wherein a signal is applied to offset responsive diodes (27,35). Thus, in view of corresponding detection circuitry of Aoki, this maintained circuit connection at 29 and the maintaining of a switch state by the latch is considered to teach detecting "the control circuit detects the DC offset when the input signal is muted and no input signal is supplied to the amplifiers".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the disconnect circuitry of the system of GrosJean as part of the non-standard DC offset detection response of the system of Aoki. The motivation behind such a modification would have been that such circuitry would have provided both amplifier and loudspeaker protection in situations wherein the DC offset is caused by a fault in the amplifier. The fault protection addressed by the system of GrosJean inferentially involves the connection of the power source to the amplifiers, as evidenced by the form of protection. The system would have also been

able to maintain a disconnection state, avoiding complications of the acting response time of other forms of protection circuitry.

Regarding **Claim 11**, each of the amplifiers (12,13) in the system of Aoki input the signal applied from the reception terminal (23) through a pair of transistors (15,16) (col. 4, lines 59-66; col. 5, lines 1-9). These connections for one of the amplifiers (12) read on "the first amplifier at least indirectly amplifies the input signal to generate the first output signal".

Regarding **Claim 12**, please refer above to the rejection of the similar limitations of Claim 10.

Regarding **Claim 13**, each of the amplifiers (12,13) in the system of Aoki input the signal applied from the reception terminal (23) through a pair of transistors (15,16) (col. 4, lines 59-66; col. 5, lines 1-9). These connections for the other amplifier (13) read on "the second amplifier at least indirectly amplifies the input signal to generate the second output signal".

Regarding **Claim 15**, please refer above to the rejection of the similar limitations of Claim 9, further noting that Aoki discloses the use of a preamplifier (11) which, through the use of a DC offset input signal (V_{OS}) and a selected combination of component values, provides an alteration of the potentials applied through the emitters of the transistors (Ve15,Ve16), altering the signal levels applied through the amplifiers (12,13) to the output terminals (28,29) (col. 8, lines 19-55). This preamplifier (11), which changes the center potential of the processed signal, maintaining it near half of the power source

voltage, reads on "a volume control circuit adapted to adjust a signal level of the input signal applied to the first and second amplifier". As noted above, GrosJean teaches a switching means (7) that involves a movable contact arm (19) and is used in the presence of a positive or negative potential to disconnect the power source from the power amplifiers (9,11) (col. 3, lines 13-16). The disconnected state of the switches (19) is maintained by a latch means, the duration of which is determined by the properties of the involved resistances and capacitances (col. 3, lines 23-35). This maintaining of a switch state according to the values of the latch circuit reads on detecting "a muting control circuit adapted to mute the input signal supplied to the first and second amplifiers for a predetermined length of time".

Regarding **Claim 16**, the difference amplifier (14) of Aoki outputs the DC offset of the pair of signals applied to the load (30) of the system (col. 5, lines 45-47). This reads on "the control circuit performs at least one of detecting the differential voltage to provide the DC offset".

Regarding **Claim 17**, the preamplifier (11) output of Aoki is automatically adjusted by directly connected signaling means as is discussed in further detail in the rejection of Claim 15 (col. 8, lines 19-66). This setting of the preamplifier output potential through the use of transistors and a feedback signal reads on "the input signal is provided by an electronic volume".

4. **Claims 1-5 and 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki as applied above, and in further view of Kalb et al (USPN 5939938), GrosJean (USPN 3959735), and Trump (USPN 4301330).

Aoki discloses balanced transformerless (BTL) circuit that maintains the DC offset voltage at an acceptable, predetermined level. The structure of one embodiment of the system is shown in Figure 2. As can be seen, the embodiment comprises the components of a signal input (23), a preamplifier (11), a set of balanced amplifiers (12,13), and a load or loudspeaker (30), and a difference amplifier (14) (col. 4, lines 30-38 col. 5, lines 1-14). The two amplifiers (12,13) are non-inverting are a part of a balanced transformerless circuit (10) that outputs a differential signal to the load (30) (col. 5, lines 1-34). In view of these amplifiers, the system shown in Figure 2 reads on "A BTL apparatus having two power amplifiers in a BTL configuration for driving a speaker". The signals that are applied to the load (30) over the pair of output terminals (28,29) are also applied to the inverting and non-inverting terminals of a difference amplifier (14) (col. 5, lines 35-41). The output of the difference amplifier (14) is a signal that represents the DC offset present in the output signal that is applied across the load (30) (col. 5, lines 45-47). This circuit and its output read on "detection means for detecting a differential voltage to provide a DC offset between outputs from the two power amplifiers". The output of the

amplifier (14) is connected to a transistor (16), which is part of the preamplifier (11)(col. 5, lines 47-51). In operation, the two potentials of the emitter terminals (Ve15,Ve16) have a specific voltage that defines a center, acceptable value of DC offset (col. 7, lines 37-68; col. 8, lines 1-66). The set of terminals detect and compensate for both positive and negative voltage in order to maintain this standard potential (col. 8, lines 56-66). The response of a these transistors to an offset voltage above or below this predetermined potential reads on "decision means for deciding whether or not said differential voltage is larger than a prescribed voltage".

However, Aoki does not specify certain components and operating conditions of the circuit, including:

- muting means for muting an input signal to be supplied to the power amplifiers during a predetermined length of time

Kalb discloses a signal suppression circuit for eliminating transient output noises that appear on an speaker input line during the "power up" and "power down" stages of an audio amplifier. The amplifier circuit includes two speaker amplifiers (102,104), which provide the speaker with a differential input signal (col. 4, lines 19-28). During a "power up" transient, these amplifiers (102,104) receive and emit a controlled voltage from a designated voltage generator (108) (col. 5, lines 22-24). A bypass switch (122) is closed during the initial part of this transient, which effectively prevents the amplifiers (102,104) from outputting the input signal voltage (col. 5, lines 18-22). A comparator (130) holds this switch

(122) in its closed, bypassing stage until the voltage generator (108) outputs a voltage that the comparator (130) determines to be higher than a reference voltage (133), at which point the input signal is not longer bypassed (col. 5, lines 34-45). Kalb discloses the making of resistors variable and the related possibility of giving the amplifiers a controllable gain (col. 9, lines 46-64). As detailed above, the switching circuit (122) provides a bypass which, in combination with reference voltage (141), prevents the input signal from being amplified by the first amplifier (102). The switching circuit and the corresponding substitution of the input signal during a controlled increase of a reference signal read on "muting means for muting the input signal to be supplied from said volume to the power amplifiers during a predetermined length of time".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include the transient stage muting means of Kalb as part of the input circuitry of Aoki. The motivation behind such a modification would have been that such muting would have prevented sudden transient noises from being emitted from the speakers before the preamplifier of Aoki is able to determine and implement a feedback signal and otherwise control the amplitude of a processed signal.

However, the system of Aoki in view of Kalb does not specify:

- that the muting means supplies no input signal to the power amplifier means while the DC offset is detected

GrosJean discloses a system for detecting and protecting a

loudspeaker output from receiving an undesirable positive or negative DC potential. Figure 2 illustrates one embodiment of the system wherein positive or negative DC potentials are applied through either of a pair of diodes (35,27) to bias a transistor (23) (col. 3, lines 9-22). The switching means (7) of the system comprises a movable contact arm (19) and is used in the presence of a positive or negative potential to disconnect the power source from the power amplifiers (9,11) (col. 3, lines 13-16). The disconnected state of the switches (19) is maintained by a latch means, the duration of which is determined by the properties of the involved resistances and capacitances (col. 3, lines 23-35). The switches also read on "muting means". This maintaining of a switch state, in view of the complete disconnection of the power source from the amplifiers, reads on detecting "while no input signal is supplied to the power amplifiers by the muting means".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to employ the complete input disconnection as taught by GrosJean in place of the ramping voltage or before the ramping voltage taught as part of the transient stage of the system of Aoki in view of Kalb. The motivation behind such a modification would have been that such a complete disconnection of input signal sources would have prevented transistor failure from applying an undesirable signal to the speakers, which in the system of Kalb corresponds to the input signal.

However, Aoki in view of Kalb and GrosJean does not specify:

- switches connected between output terminals of the power amplifiers and the speaker
- that the switches are turned off when it is decided the differential voltage is larger than the prescribed voltage, preventing the speaker from being supplied with the output signals from the power amplifiers

Trump discloses a loudspeaker protection circuit for sensing a DC signal at an unacceptable voltage being applied to a loudspeaker. The presence of a DC signal of undesirable levels is determined based on the successive lengths of time that a signal exceeds a given voltage range (col. 3, lines 4-20). The detection of a signal that exceeds the given voltage is compared with the length of time that the signal previously exceeded the given voltage range (col. 2, lines 35-49). Non-matching excursions beyond the given range indicate the presence of a potentially damaging condition (col. 2, lines 58-62). The detection of a damaging condition or undesirable amount of DC current triggers a switch (250) connected in series between the amplifier output and the loudspeaker to be disconnected (col. 3, lines 20-24). This switch, in the context of a balanced transformerless arrangement that applies two audio signals to a speaker, reads on "switches connected between output terminals of the power amplifiers and the speaker". The concept of the switches being altered based on the exceeding of a given amount of DC voltage reads on "whereby the switches are turned off when it is decided that the differential voltage is larger than the prescribed voltage, for preventing the

speaker from being supplied with the output signals from the power amplifiers".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to utilize the switching circuits and corresponding control circuitry of Trump to handle the detected DC offset ranges in the system of Aoki in view of Kalb and GrosJean. The motivation behind such a modification would have been that such an arrangement would have completely removed the potentially damaging voltage from the speaker input. The system of Aoki responds to a undesirable potential by providing feedback that, as the DC offset increases or a large offset quickly appears, provides a larger feedback signal as compensation, whereas the system of Trump would have removed the excessive voltage from the speaker inputs while the offset returns to acceptable levels. Such circuitry of Trump would have provided loudspeaker protection under the conditions of an improper input signal as well as a fault within the amplifier.

Regarding **Claim 2,** Kalb discloses the making of resistors variable and the related possibility of giving the amplifiers a controllable gain (col. 9, lines 46-64). Such a modification would have involved making the resistor (120) that provides the feedback across the first amplifier (116) variable. This would have altered the signal level provided to the speakers and reads on "volume means". Aoki discloses the use of a preamplifier (11) that, through the use of a DC offset input signal (V_{OS}) and a selected combination of component values, provides an alteration of the potentials applied through the

emitters of the transistors (Ve15,Ve16), which alters the signal levels applied through the amplifiers (12,13) to the output terminals (28,29) (col. 8, lines 19-55). This preamplifier (18), which changes the center potential of the processed signal, maintaining it near half of the power source voltage, reads on "volume means for adjusting a signal level of said input signal level of said input signal to the amplifiers". As detailed above, the switching circuit (122) of Kalb provides a bypass which, in combination with reference voltage (141), prevents the input signal from being amplified by the first amplifier (102) during the time period of which comparisons are made by the voltage comparator (130) of the system of Kalb. Also in the system of Aoki, the comparison that controls the state of the loudspeaker protection circuit is based on the production of a DC offset signal by an included difference amplifier (14) (col. 5, lines 35-50). Changes to the mute condition in the system of GrosJean also require the determination of the detected DC offset. Accordingly, the comparisons made in the system of Kalb which control the state of the overall system, in view of the values of comparison in the system of Aoki and GrosJean reads on "muting means for muting the input signal to be supplied from said volume to the power amplifiers during a predetermined length of time required to provide the DC offset by stopping the input amplifiers".

Regarding **Claim 3**, the system of Kalb specifically operates during the "power on" and "power off" transient periods of the audio amplifier system, which reads on "detection means and decision means

are operated when a power switch is turned on or a signal source is selected" (col. 4, lines 60-67 and col. 5, lines 1-18).

Regarding **Claim 4**, the system of Trump discloses the use of logic states for establishing the operation of the system as it particularly relates to the output voltage of the system (col. 6, lines 1-27). This logic-based control of signal, in the context discussed above in regards to Claim 2, reads on "said volume means is an electronic volume". It is further noted that the preamplifier (11) output in the system of Aoki is automatically adjusted by directly connected signaling means, which also reads on "an electronic volume".

Regarding **Claim 5**, please refer above to the rejection of the similar limitations of Claim 1, noting that Trump discloses the option of disabling (260) the amplifier of an audio circuit in the presence of a detected undesirable signal (col. 3, lines 34-45). This option, in view of the pair amplifiers in a BTL arrangement reads on "activation/deactivation means for activating/deactivating the power amplifiers, which deactivates said power amplifiers when it is decided that the DC offset is larger than said prescribed voltage by the decision means".

Regarding **Claim 7**, Trump teaches that the use of a delay of sufficient length will provide audible indication as to the undesirable signal situation (col. 3, lines 30-33). The inclusion and use of such a delay means reads on "warning means for giving a warning when it is decided that said DC offset is larger than prescribed voltage by said decision means".

Regarding **Claim 8**, please refer to the above rejections of the similar limitations of Claims 1, 2, and 5, noting that switch (260) of Trump is disclosed as being reconnected (col. 3, lines 39-45) and the bypass circuit of Kalb is re-opened after a period of time determined by charging circuitry (col. 5, lines 37-41).

5. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki in view of GrosJean as applied above to Claim 9, and in further view of Trump.

As detailed above, Aoki discloses balanced transformerless (BTL) circuit that maintains the DC offset voltage at an acceptable, predetermined level. GrosJean discloses a system for detecting and protecting a loudspeaker output from receiving an undesirable positive or negative DC potential.

The system of Aoki in view of GrosJean does not specify:

- at least one activation/deactivation circuit adapted to activate or deactivate at least one of the first and second amplifiers responsive to the determination of whether or not the DC offset is larger than the prescribed voltage

Trump discloses a loudspeaker protection circuit for sensing a DC signal at an unacceptable voltage being applied to a loudspeaker. The presence of a DC signal of undesirable levels is determined based on the successive lengths of time that a signal exceeds a given voltage

range (col. 3, lines 4-20). The detection of a signal that exceeds the given voltage is compared with the length of time that the signal previously exceeded the given voltage range (col. 2, lines 35-49). Non-matching excursions beyond the range indicate the presence of a potentially damaging condition, beyond an given range (col. 2, lines 58-62). The detection of a damaging condition or undesirable amount of DC current triggers a switch connected in series between the amplifier output and the loudspeaker to be disconnected (col. 3, lines 20-24). Trump also discloses the option of disabling (260) the amplifier it an audio circuit in the presence of a detected undesirable signal (col. 3, lines 34-45). This option, in view of the pair amplifiers in a BTL arrangement reads on "at least one activation/deactivation circuit adapted to activate or deactivate at least one of the first and second amplifiers responsive to the determination of whether or not the DC offset is larger than the prescribed voltage".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate power supply deactivation means such as taught by Trump to prevent the application of the output signal to a load in the system of Aoki in view of GrosJean. The motivation behind such a modification would have been that such an arrangement would have removed power from the amplifier when a potentially damaging condition occurs, providing protection to the loudspeaker under conditions including a fault within the amplifier. The use if amplifier condition detection and control

circuitry along with muting circuitry is known in the art, as evidenced by the teachings of Kalb referred to above.

Regarding **Claim 19**, in the system of Trump, the detection of a damaging condition or undesirable amount of DC current triggers a switch (250) connected in series between the amplifier output and the loudspeaker to be disconnected (col. 3, lines 20-24). This switch, in the context of a balanced transformerless arrangement that applies two audio signals to a speaker, reads on "a switch between at least one of the first and second amplifiers and a speaker, wherein the switch is adapted to prevent at least one of the first and second output signals from being supplied to the speaker responsive to the determination of whether or not the DC offset is larger than the prescribed voltage".

Regarding **Claim 20**, Trump teaches that the use of a delay of sufficient length will provide audible indication as to the undesirable signal situation (col. 3, lines 30-33). The inclusion and use of such a delay means reads on "a warning circuit adapted top activate a warning device responsive to the determination of whether or not the DC offset is larger than the prescribed voltage".

Regarding **Claim 21**, please refer to the above rejections of the similar limitations of Claims 15 and 18, noting that Trump teaches a period of sufficiently long silence as desirable (col. 3, lines 25-33), which in view of the combined system would have provided motivation for modifying the composite device such that the muting provided by the circuitry of GrosJean ceases as well.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ag

Andrew Graham

Examiner
A.U. 2644

ag
July 11, 2005

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600